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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,915	01/07/2005	Satoshi Mizutani	3712174.00491	5221
29175	7590	01/14/2010		
K&L Gates LLP P. O. BOX 1135 CHICAGO, IL 60690			EXAMINER CHUO, TONY SHENG HSIANG	
			ART UNIT 1795	PAPER NUMBER
			NOTIFICATION DATE 01/14/2010	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

# Office Action Summary

**Application No.**

10/520,915

**Applicant(s)**

MIZUTANI ET AL.

**Examiner**

Tony Chuo

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 October 2009.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 41, 42, 44, 45, 47-64, 66, 67 and 69-86 is/are pending in the application.  
4a) Of the above claim(s) 50-62 and 72-80 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 41, 42, 44, 45, 47-49, 63, 64, 66, 67, 69-71 and 81-86 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

1. Claims 41, 42, 44, 45, 47-64, 66, 67, and 69-86 are currently pending. Claims 1-40, 43, 46, 65, and 68 are cancelled. Claims 50-62 and 72-80 are withdrawn from further consideration as being drawn to a non-elected invention. New claims 81-86 have been added. The amended claims do overcome the previously stated 102 and 103 rejections. However, upon further consideration, claims 41, 42, 44, 45, 47-49, 63, 64, 66, 67, 69-71, and 81-86 are rejected under the following new 103 rejections. This action is made FINAL as necessitated by the amendment.

### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claim 63 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 7, and 8 of copending Application No. 11/267,641. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter of claim 63 is fully anticipated by the claims of copending Application No. 11/267,641.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. Claims 41, 42, 63, and 64 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 9-11, 18, 19, 26, and 27 of copending Application No. 12/026,594. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter of claims 41, 42, 63, and 64 is fully anticipated by the claims of copending Application No. 12/026,594.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

5. Claims 41, 49, 63, and 71 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 7, and 8 of copending Application No. 11/268,010. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject

matter of claims 41, 49, 63, and 71 is fully anticipated by the claims of copending Application No. 11/268,010.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. Claim 63 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 4, 7, 9, and 10 of copending Application No. 11/267,116. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter of claim 63 is fully anticipated by the claims of copending Application No. 11/267,116.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

7. Claims 41, 42, 63, and 64 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 and 10-12 of copending Application No. 11/225,540. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter of claims 41, 42, 63, and 64 is fully anticipated by the claims of copending Application No. 11/225,540.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 41, 42, 49, 63, 64, 71, 81, 82, 84, and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turner et al (US 6203944).

The Turner reference discloses a battery comprising: a cathode, an anode, and an electrolyte, wherein the anode mixture layer comprises 86 wt% anode material having a reaction phase containing tin (element capable of generating an intermetallic compound with lithium), iron, and graphite (carbon), wherein specific examples of the anode material include 6 wt% carbon and 7.2 wt% carbon; and 8 wt% carbon black (carbonaceous material capable of inserting and extracting lithium) (See column 1, lines 64-67, column 6, lines 28-45, column 16, line 29-34, and Examples 17 and 19). It also discloses crystal sizes of less than about 500 angstrom (0.05  $\mu\text{m}$ ) (See column 5, lines 7-11).

However, Turner et al does not expressly teach a ratio of carbon in the reaction phase that ranges from about 10% by weight to about 40% by weight.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Turner anode to include a ratio of carbon in the reaction phase that ranges from about 10% by weight to about 40% by weight because even if the range of prior art and the claimed range do not overlap, obviousness may

still exist if the ranges are close enough that one would not expect a difference in properties (*In re Woodruff* 16 USPQ 2d 1934 (Fed. Cir. 1990)). It is the position of the examiner that 7.2 wt% carbon is close enough to 10 wt% carbon that one of ordinary skill in the art would not expect a difference in properties. In addition, there is no evidence of the criticality of the claimed range of carbon ratio in the reaction phase. Further, it is the position of the examiner that the property "A peak of carbon that is obtained in a region lower than about 284.5 eV by x-ray photoelectron spectroscopy" is an inherent property of the Turner anode material because Turner et al discloses an anode material with a similar composition as the anode material recited in claims 41 and 63 of the present invention.

10. Claims 41, 42, 45, 47-49, 63, 64, 67, 69-71, 81, 82, 84, and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohno et al (US 6495291) in view of Kawakami et al (JP 2000-311681).

The Kohno reference discloses a non-aqueous secondary battery comprising a positive electrode (cathode), a negative electrode (anode), and a non-aqueous electrolyte, wherein the negative electrode comprises 70 to 95% by weight of negative electrode active material and 0 to 25% by weight of a conductive agent such as acetylene black, carbon black and graphite, wherein the negative electrode active material comprises a composition that is  $M1_xM2_yC_{1-x-y}$ , wherein x and y are atomic ratios, wherein M1 is at least one element selected from the group consisting of Si, Ge, Sn, Pb, B, Al, Ga, In, Sb, and Zn, wherein M2 is at least one element selected from Mg, Ca, Sr, Ba, Ti, Zr, V, Ta, Cr, Mo, and W, wherein an example of the negative electrode

active material shown in Table 1 is  $\text{Sn}_{0.25}\text{Mg}_{0.03}\text{Co}_{0.72}$  which corresponds to 22.1 wt% carbon when the atomic ratios are converted to weight percent (See column 4 line 18 to column 5 line 3, column 9, lines 11-22, and Table 1, Example 1). It also discloses that the particle diameter of the composite material that is within a range of between 0.1  $\mu\text{m}$  and 50  $\mu\text{m}$  (See column 8, lines 27-29). It also discloses an average size of the crystal phase that is within a range of between 0.03  $\mu\text{m}$  and 8  $\mu\text{m}$  (See column 6, lines 37-40). Examiner's note: Ti, Zr, V, Ta, Cr, Mo, and W are elements from Group 4 to Group 6 in a long period periodic table. It is inherent that anode material particles with a particle diameter within a range of between 0.1  $\mu\text{m}$  and 50  $\mu\text{m}$  has a specific surface area of the anode material that ranges from about 0.05  $\text{m}^2/\text{g}$  to about 70  $\text{m}^2/\text{g}$ .

However, Kohno et al does not expressly teach a reaction phase that contains at least one constituent selected from the group consisting of nickel, copper, iron, cobalt, manganese, zinc, indium, and silver. The Kawakami reference discloses a negative electrode material for a lithium secondary battery containing particles having a composition expressed by formula  $\text{Sn.A.X}$ , wherein A is at least one kind of transition metal chosen from Cr, Mn, Fe, Co, Ni, Cu, Mo, Tc, Ru, Rh, Pd, Ag, Ir, Pt, Au, Ti, V, Y, Sc, Zr, Nb, Hf, Ta, and W, wherein X is at least one kind selected from a group comprising O, F, N, Mg, Ba, Sr, Ca, La, Ce, Si, Ge, C, P, B, Bi, Sb, Al, In, S, Se, Te, and Zn, wherein examples of the negative electrode material are Sn-Ni-C, Sn-Fe-C, Sn-Cu-C, Sn-Co-C, Sn-Fe-Ni-C (See Abstract and paragraphs [0033],[0099]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Kohno negative electrode active material by



substituting the elements of M2 for at least one constituent selected from the group consisting of nickel, copper, iron, cobalt, manganese, zinc, indium, and silver in order to utilize elements that provide an electrode structural body capable of contributing to a lithium secondary battery having a long cycle life, high capacity, and high energy density (See Abstract). In addition, the substitution of one known M2 element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

11. Claims 44 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohno et al (US 6495291) in view of Kawakami et al (JP 2000-311681) as applied to claims 41 and 63 above. In addition, Kawakami also discloses a negative electrode material that contains an alloy of tin, cobalt, carbon, and a fourth element (See Table 11, sample no. 20). It also discloses an element X of the alloy that is at least one kind selected from O, F, N, Mg, Ba, Sr, Ca, La, Ce, Si, Ge, C, P, B, Bi, Sb, Al, In, S, Se, Te, and Zn (See Abstract).

However, Kohno et al as modified by Kawakami et al does expressly teach a reaction phase that contains at least one selected from the group consisting of zinc, indium, and silver.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to try to form an alloy from a finite number of identified alloying elements that are used in anode active materials with a reasonable expectation of success such as long cycle life, high capacity, and high energy density.

12. Claims 83 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohno et al (US 6495291) in view of Kawakami et al (JP 2000-311681) as applied to claims 41 and 63 above.

However, Kohno et al as modified by Kawakami et al does expressly teach a carbonaceous material capable of inserting and extracting lithium in about equal ratio with the anode material.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Kohno/Kawakami negative electrode to include a carbonaceous material capable of inserting and extracting lithium in about equal ratio with the anode material because changes in proportions was held to be obvious (*In re Fields* 134 USPQ 242 (CCPA 1962); *In re Reese* 129 USPQ 402 (CCPA 1961)). In addition, there is no evidence of criticality of the ratio of carbonaceous material to anode material.

### ***Response to Arguments***

13. Applicant's arguments with respect to claim 41, 42, 44, 45, 47-49, 63, 64, 66, 67, and 69-71 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

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TC

/Jonathan Crepeau/  
Primary Examiner, Art Unit 1795